

SIX SIGMA REDUCES LEAK RATE

ABOUT ADVANCED DISTRIBUTOR PRODUCTS LLC. Advanced Distributor Products (ADP) is the leading manufacturer of residential evaporator coils in North America. In business for over 25 years, ADP is a wholly owned subsidiary of Lennox International Inc. (LII). The company competes globally through the rapid implementation of innovation and high technology in its products and manufacturing operations. Based in Grenada, Mississippi, with close to six hundred employees, ADP has a \$265 million revenue stream and produces on average 1.3 million evaporator coils annually.

THE CHALLENGE. ADP needed to reduce the leak rate of its automatic brazing process. The company sent several of its manufacturing engineers to a Six Sigma Black Belt certification training at the Mississippi Manufacturers Association Center (MMA-MEP), part of the MEP National Network and the Center for Advanced Vehicular Systems (CAVS) at Mississippi State University (MSU). During this training, ADP engineers found a direct correlation between the company's leak rate and its production line output. To improve output and increase quality, MMA-MEP engaged the engineers in a project that focused on ADP's automatic brazing machine and coil expansion machine.

MEP CENTER'S ROLE. The Six Sigma project team assessed the root cause of the leak rate, finding numerous issues with the expander and the auto-brazer that created a bottleneck at the test and repair stations. The team applied the DMAIC methodology (define, measure, analyze, improve, control) to improve the process. ADP installed improved automatic back plates on the expander and implemented a weekly scorecard for the auto-brazer operator. It also modified the auto-brazer settings based on analysis from the Six Sigma team. The company started using visual leak cues at the auto-brazer to diagnose problems, and revised work instructions for both operations. Beyond reducing the leak rate, the changes reduced scrap, generated cost savings, increased line output, and expanded yearly revenue. ADP enhanced its performance monitoring systems to ensure continuous improvement.

"Thanks to the work of the MMA-MEP MSU-CAVS Extension, ADP has made sustainable improvements to the productivity and profitability of the plant. In addition, there were immeasurable gains from the improvement in the quality of the product. The quality gains due to this project will undoubtedly allow the evaporator coils sold at ADP to last longer in the field, improving the customer experience for the homeowner."

-Paxton K. Griffin, Ph.D., P.E., Manager, Manufacturing Engineering

RESULTS



3% reduction in first pass yield leak rate



5% increase in line output (bottleneck reduction)



\$2.8M in yearly increased potential revenue



50% weekly scrap reduction due to expansion (on this line)



\$140K in yearly reduced scrap

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